

REMARKSAmended Specification

Applicant has amended certain portions of the specification to further clarify important aspects of Applicant's invention. Any changes and/or additions are fully supported by the original specification and/or by priority documents of said inventor which were referenced and incorporated by the original application.

Amended Claims

Applicant has amended claims 1-4, 6-10, and 12-19. Any changes and/or additions are fully supported by the original specification and/or by priority application(s) of said inventor which were referenced and incorporated by the original application.

Claim Rejections under 35 USC § 112

Applicant has addressed Examiners rejection of claims 6-8 and 13-15 for being indefinite by removing the word "preferably". Applicant respectfully submits that amended claims 6-8 and 13-15 are no longer indefinite.

Claim Rejections under 35 USC § 103

The rejection of claims 1-20, under 35 U.S.C. §103(a), as being unpatentable over U.S. Patent 5,149,368 issued to Liu et al ("Liu") as contended by Examiner has been addressed. Applicant has amended claims 1-4, 6-10, and 12-19 and respectfully submits that there is now insufficient basis for regarding Applicant's amended claims 1-20 as being obvious in light of Liu.

Applicant respectfully asserts that Applicant's amended claims 1-20 are not obvious in light of Liu for several important reasons. Liu's patent is directed to a bio-active cement comprising tetracalcium phosphate, a setting agent consisting essentially of acidic citrate, and water, wherein the ratio of cementing powder to setting reagent lies between 2:1 and 15:1.

Liu's tetracalcium phosphate based composition varies considerably from Applicants' mono-potassium ("MKP") based refractory composition comprising  $\text{KH}_2\text{PO}_4$ , a metal oxide and a calcium containing compound. A number of important differences are discussed below, including the use of  $\text{KH}_2\text{PO}_4$ , as the metal phosphate (See, Applicant's original claim 17, amended claims 1-17) which was not addressed by Examiner.

One of the most obvious differences between Liu's composition and that of the Applicant is Liu's teaching of a calcium citrate as an essential part of its disclosed composition. The importance of calcium citrate (or citrate salt) to Liu's invention is evident in its specification and claims. Since calcium citrate is central to Liu's composition it would not be obvious to remove it from Liu's composition to form a composition similar to that disclosed by Applicant. Even if one skilled in the art did remove the citrate from the Liu composition, Applicant's composition would still be unobvious.

Examiner suggests that it would be obvious for one skilled in the art to combine several compounds briefly disclosed by Liu (presented in a laundry list of possible pH adjusters and inert fillers) to achieve that which is claimed by Applicant. As discussed below, Applicant respectfully disagrees. "The mere fact that the prior art may be modified in a manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F. 2d 1260 at 1266 (1992)." The modifications necessary to change Liu's invention to that of Applicant is never disclosed or even suggested and would require undue experimentation.

Applicant amended the composition of claim 1 to comprise:  $\text{KH}_2\text{PO}_4$ , a metal oxide and a calcium containing compound. The importance of  $\text{KH}_2\text{PO}_4$  to the invented composition is obvious in light of Applicant's original and amended specification, original claim 17 and amended claims 1-17. While Liu mentions the possibility of using potassium phosphate (among

various other compounds) as a pH modifier in its specification, Liu specifically limits the potassium phosphates in its claims to  $K_3PO_4$  and  $K_2HPO_4$ . (See Liu claim 5).

Furthermore, Liu teaches potassium phosphate only as a pH modifier added to the setting agent, not an essential component of the overall composition. Since Liu teaches a setting agent **consisting essentially of acidic citrate** the pH modifier (modifying the setting agent) as read in light of the specification and claims would be limited to a small portion of the overall composition. (See, Liu Col. 3 lines 50-60, and claims 1-14) The courts have held that the "the signal '**consisting essentially** of' allows for the presence of small amounts of components outside of the designated [composition]." Talbert Fuel Sys. Patents Co. v. Unocal Corp., 275 F.3d 1371, 2002 U.S. App. Therefore, Liu teaches using potassium phosphate in small portions of the setting agent, and an even smaller portion of the entire cement.

On the other hand, MKP is a salient part of Applicant's invention and is present in large amounts for example between 25-75 weight percent, preferably between 40-65 weight percent (see Applicants original specification pages 4-7, original claim 17, and amended claims 1-17). Applicant's exemplary compositions make clear that Applicant's composition is based on potassium phosphate, preferably MKP. (See, Applicant's original specification page 7 "preferably mono potassium phosphate".) It would not be obvious for a skilled artisan to create a composition based on MKP when MKP is not specifically disclosed and is furthermore specifically omitted (teaching against) from a list of possible pH modifiers. (See, Liu claim 5) Potassium phosphate in general is only briefly disclosed by Liu among a long list of potential pH modifiers to be used in limited amounts.

Examiner also suggests that Liu's disclosure of MgO as one of a myriad of fillers makes the use of metal oxides in Applicant's composition obvious. Given the number of fillers Liu teaches it would not be obvious to use a metal oxide like MgO in the amounts taught by Applicant's, especially in combination with MKP and in the weight ratios disclosed by Applicant.

It is apparent from Applicant's specification, examples and claims that a metal oxide (preferably MgO) is critical to Applicant's invention. See, Applicant's original specification pages 4-7, page 7, paragraphs 5 and 6, and amended claims 1-20. Furthermore, Liu disclosed the use of MgO as an inert filler and not as an active ingredient. Applicant respectfully asserts that it would not be obvious to modify Liu's composition to that taught by Applicants.

Liu also fails to teach a weight percent ratio between  $\text{KH}_2\text{PO}_4$  and the metal oxide as disclosed by Applicants original and amended claims. The taught weight percent ratio is an important aspect of Applicant's disclosure as is clear from Applicant's amended specification and original and amended claims. (See, *Jennings v. Brenner*, Comr. Pats., 150 USPQ 167) Liu fails to teach or even suggests the importance of a weight percent ratio between  $\text{KH}_2\text{PO}_4$  and a metal oxide (i.e. MgO). Liu emphasizes a ratio but it is between tetracalcium phosphate and the acidic citrate. Clearly if Liu believed the ratio between MKP and a metal oxide was important Liu would have discussed or at least suggested it.

Applicant's amended claim 9 teaches using  $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$  as the calcium containing compound. This is in direct contrast the Liu patent which teaches away from the use of hydroxyapatite, Liu stating that "hydroxyapatite and beta-tricalcium phosphate, because of their slow dissolution rate, cannot form a good setting cement . . .". The only hydroxyapatite that Liu teaches is a fully decomposed hydroxyapatite. The use of  $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})$  in the invented composition is supported by priority application No. 09/602,067, now patent No. 5,33,821 submitted by instant invention and incorporated by reference in the present application.

Several other differences also exist including Applicant's use of calcium silicate and silicon dioxide.

In order to come up with Applicants amended claimed composition, a skilled artisan would have to: (1) eliminate a key component of Liu's composition, (2) combine two compounds not essential to Liu's invention one of which was briefly referred to (MgO), the other not

specifically mentioned (MKP), and make those two compounds the basis of a new refractory product with a completely different use than that disclosed in Liu. Applicant respectfully submits that Applicant's composition would be unobvious even to a skilled artisan in the art. A skilled artisan would be required to perform an inordinate amount of experimentation in order to achieve Applicant's composition, with no reasonable assurance of success.

Applicant respectfully asserts that amended claims 1-20 are unobvious in light of Liu and are in condition for allowance.

#### Provisional Double Patenting Rejection

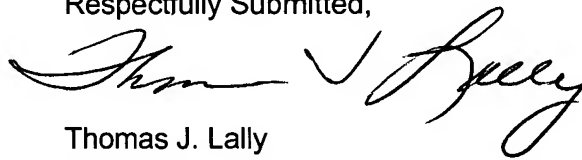
The provisional obviousness-type double patenting rejection over co-pending Application No. 10/338,425 has been addressed. Applicant is filing a terminal disclaimer to obviate the double patent rejection, the disclaimer being filed herewith.

The obviousness-type double patenting rejection over U.S. Patent No. 6,533,821 has been addressed. Applicant is filing a terminal disclaimer to obviate the double patent rejection, the disclaimer being filed herewith. Applicant respectfully asserts that the double patenting objections have been overcome.

#### CONCLUSION

For the foregoing reasons, Applicant respectfully requests that the Examiner allow Amended claims 1-20, as indicated on the attached complete listing of claims.

Respectfully Submitted,



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630-920-8679

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Attachment(s)